

L24 2 FILE ANABSTR
L25 1 FILE CERAB
L26 1 FILE METADEX

TOTAL FOR ALL FILES

L27 78 CANTILEVER AND PHOTODIODE

=> s l27 and silicon

L28 21 FILE CAPLUS
L29 0 FILE BIOTECHNO
L30 9 FILE COMPENDEX
L31 0 FILE ANABSTR
L32 1 FILE CERAB
L33 0 FILE METADEX

TOTAL FOR ALL FILES

L34 31 L27 AND SILICON

=> dup rem

ENTER L# LIST OR (END):134

PROCESSING COMPLETED FOR L34

L35 28 DUP REM L34 (3 DUPLICATES REMOVED)

=> s l35 and split

L36 21 S L35
L37 0 FILE CAPLUS
L38 0 S L35
L39 0 FILE BIOTECHNO
L40 7 S L35
L41 0 FILE COMPENDEX
L42 0 S L35
L43 0 FILE ANABSTR
L44 0 S L35
L45 0 FILE CERAB
L46 0 S L35
L47 0 FILE METADEX

TOTAL FOR ALL FILES

L48 0 L35 AND SPLIT

=> s l35 and py<2001

L49 21 S L35
L50 15 FILE CAPLUS
L51 0 S L35
L52 0 FILE BIOTECHNO
L53 7 S L35
L54 7 FILE COMPENDEX
L55 0 S L35
L56 0 FILE ANABSTR
L57 0 S L35
L58 0 FILE CERAB
L59 0 S L35
L60 0 FILE METADEX

TOTAL FOR ALL FILES

L61 22 L35 AND PY<2001

=> d l61 ibib abs total

L61 ANSWER 1 OF 22 CAPLUS COPYRIGHT 2002 ACS

ACCESSION NUMBER: 2001:196553 CAPLUS

DOCUMENT NUMBER: 134:333910

TITLE: A micromachined accelerometer based on optical
transduction

AUTHOR(S): Nannini, A.; Pieri, F.
 CORPORATE SOURCE: Dipartimento di Ingegneria dell'Informazione:
 Elettronica Informatica, Universita di Pisa, Pisa,
 56126, Italy
 SOURCE: Sensors and Microsystems, Proceedings of the Italian
 Conference: Extended to Mediterranean Countries, 5th,
 Lecce, Italy, Feb. 12-16, 2000 (2000),
 340-344. Editor(s): Di Natale, Corrado; D'Amico,
 Arnaldo; Siciliano, Pietro. World Scientific
 Publishing Co. Pte. Ltd.: Singapore, Singapore.
 CODEN: 69AZQQ
 DOCUMENT TYPE: Conference
 LANGUAGE: English
 AB An optical acceleration sensor with on-board sensing **photodiode**
 is proposed. An optical fiber is mounted on a suspended Si
cantilever, fabricated with anisotropic etching of single-crystal
 Si. Under the effect of vertical acceleration, the fiber tip is shadowed
 by the Si bulk and the light collected by a Si **photodiode** with
 an In Sn oxide (ITO) transparent cathode, integrated on the device, is
 lowered accordingly. Mech. properties of the structure were simulated
 with ANSYS. The device was tested under static deflection: direct
 absorption of the light by the shadowing Si bulk, and the consequent
 photocurrent generation, is a limitation on the overall output
 sensitivity: nevertheless, the current variation between min. and max.
 value corresponds to a predicted sensitivity of .apprx.3 .mu.m/g.
 REFERENCE COUNT: 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS
 RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L61 ANSWER 2 OF 22 CAPLUS COPYRIGHT 2002 ACS
 ACCESSION NUMBER: 2001:148027 CAPLUS
 DOCUMENT NUMBER: 134:288499
 TITLE: Technological processes and modeling of
 opto-electro-mechanical microstructures
 AUTHOR(S): Muller, Raluca; Poladian, V. Moagar; Pavelescu, I.;
 Manea, Elena; Cristea, Dana; Obreja, Paula
 CORPORATE SOURCE: National Institute for R and D in Microtechnologies -
 IMT, Bucharest, R-72225, Rom.
 SOURCE: Materials Science in Semiconductor Processing (
 2000), 3(5/6), 427-431
 CODEN: MSSPFQ; ISSN: 1369-8001
 PUBLISHER: Elsevier Science Ltd.
 DOCUMENT TYPE: Journal
 LANGUAGE: English
 AB Micromachining is a promising technol. for the development of microsensor
 applications, based on integrated optics circuits. This paper presents
 technol. processes for fabrication of an opto-electro-mech.
 microstructure. Optical waveguides were integrated with
photodiodes and three-dimensional structures (**cantilevers**
) on a **silicon** substrate. We performed different analyses for
 reducing the induced tensile stress in the mech. parts. We estd. the
 stress using ANSYS modeling.
 REFERENCE COUNT: 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS
 RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L61 ANSWER 3 OF 22 CAPLUS COPYRIGHT 2002 ACS
 ACCESSION NUMBER: 2000:25163 CAPLUS
 DOCUMENT NUMBER: 132:171534
 TITLE: Optical beam deflection noncontact atomic force
 microscope optimized with three-dimensional beam
 adjustment mechanism
 AUTHOR(S): Yokoyama, Kousuke; Ochi, Taketoshi; Uchihashi,
 Takayuki; Ashino, Makoto; Sugawara, Yasuhiro; Suehira,
 Nobuhito; Morita, Seizo
 CORPORATE SOURCE: Graduate School of Engineering, Department of

Electronic Engineering, Osaka University, Suita,
Osaka, 565-0871, Japan
SOURCE: Review of Scientific Instruments (2000),
71(1), 128-132
CODEN: RSINAK; ISSN: 0034-6748
PUBLISHER: American Institute of Physics
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The authors present a design and performance of an optical beam deflection
noncontact at. force microscope (nc-AFM). The optical deflection
detection system can be optimized by the 3-dimensional beam position
adjustment mechanism (the slider which mounts laser diode module, the
spherical rotors with mirror and the cylinder which mounts quadrant
photodiode) using inertial stepping motors in an ultrahigh vacuum
(UHV). The samples and **cantilevers** are easily exchanged in UHV.
The performance of the instrument is demonstrated with the atomically
resolved nc-AFM images for various surfaces such as Si(111)7.times.7,
Cu(111), TiO2(110), and thymine/highly oriented pyrolytic graphite.
REFERENCE COUNT: 38 THERE ARE 38 CITED REFERENCES AVAILABLE FOR THIS
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L61 ANSWER 4 OF 22 CAPLUS COPYRIGHT 2002 ACS
ACCESSION NUMBER: 1999:760977 CAPLUS
DOCUMENT NUMBER: 132:18235
TITLE: Integrated optics circuits for opto-electro-mechanical
microsensors
AUTHOR(S): Muller, Raluca; Cristea, Dana; Pavelescu, Ioan;
Craciunoiu, Florea; Dascalu, Dan
CORPORATE SOURCE: National Institute for Research and Development in
Microtechnologie, Bucharest, Rom.
SOURCE: NEXUS Research News (1999), 2, 8-11
CODEN: NRNEF6
PUBLISHER: Institute of Electronic Materials Technology
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The rapid progress of optical communication networks det. an important
role of integrated optics circuits, based on **silicon**, because
they are suitable for large scale integration and mass prodn. Also
integrated optics circuits and microsystems bring both the advantages of
classic optics: insensitivity to the electromagnetic noise, noncontact
measurements (which allows optical sensors to be used in harsh
environments) and the advantage of integration: miniaturization, better
reliability, low cost. The authors present the integration on the same
silicon substrate of different components: photodetectors,
waveguides, coupling elements, interferometers and 3-dimensional movable
microstructures and the hybrid integration of LED's to realize
microsensors.
REFERENCE COUNT: 12 THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L61 ANSWER 5 OF 22 CAPLUS COPYRIGHT 2002 ACS
ACCESSION NUMBER: 1999:335630 CAPLUS
DOCUMENT NUMBER: 131:95527
TITLE: Micromachined photonic integrated circuits for sensor
applications - experimental results
AUTHOR(S): Cristea, Dana; Muller, Raluca; Pavelescu, Ioan
CORPORATE SOURCE: National Institute for R and D in Microtechnologies,
Bucharest, RO-72225, Rom.
SOURCE: Proceedings of SPIE-The International Society for
Optical Engineering (1999), 3680(Pt. 2,
Design, Test and Microfabrication of MEMS and MOEMS),
1141-1150
CODEN: PSISDG; ISSN: 0277-786X
PUBLISHER: SPIE-The International Society for Optical Engineering

DOCUMENT TYPE: Journal
LANGUAGE: English

AB The paper presents the integration on the same chip of: Mach-Zehnder interferometers and Y junctions based on SiON waveguides, 3D movable micromech. structures (diaphragms and **cantilevers**), optical couplers and photodetectors for optical read-out. The SiON low loss optical waveguides were fabricated by LPCVD processes, compatible with CMOS technol. The diaphragms, used for pressure sensing, obtained by p+ etch stop techniques, were placed under the sensing arm of the interferometer. The **cantilevers**, used in micromech. resonators were manufd. by front side micromachining. The optical waveguides were coupled with different types of photodetectors, for optical read-out. Also expts. for hybrid integration of an emitting device have been performed. We used an AlGaAs emitting diode ($\lambda_p = 628$ nm), with high edge emission, mounted in a **silicon** groove, on the same wafer with the sensor. The lateral emitted light is coupled in the waveguide. One of the main problems that had to be solved will be the matching of all the involved technologies. The result of our research is the demonstration of the compatibility between the technol. processes involved and the possibility of integration on the same **silicon** substrate of different components: waveguides, **photodiodes**, emitting devices, 3D movable microstructures in order to realize intelligent microsensors.

REFERENCE COUNT: 38 THERE ARE 38 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L61 ANSWER 6 OF 22 CAPLUS COPYRIGHT 2002 ACS

ACCESSION NUMBER: 1998:146599 CAPLUS
DOCUMENT NUMBER: 128:175556
TITLE: Microcantilever sensor
INVENTOR(S): Thundat, Thomas G.; Wachter, Eric A.
PATENT ASSIGNEE(S): Lockheed Martin Energy Systems, Inc., USA
SOURCE: U.S., 13 pp.
CODEN: USXXAM
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------------------------|------|----------|-----------------|--------------|
| US 5719324 | A | 19980217 | US 1995-491203 | 19950616 <-- |
| PRIORITY APPLN. INFO.: | | | US 1995-491203 | 19950616 |

AB An improved microcantilever sensor is fabricated with at least one microcantilever attached to a piezoelec. transducer. The microcantilever is partially surface treated with a compd. selective substance having substantially exclusive affinity for a targeted compd. in a monitored atm. The microcantilever sensor is also provided with a frequency detection means and a bending detection means. The frequency detection means is capable of detecting changes in the resonance frequency of the vibrated microcantilever in the monitored atm. The bending detection means is capable of detecting changes in the bending of the vibrated microcantilever in the monitored atm. coactively with the frequency detection means. The piezoelec. transducer is excited by an oscillator means which provides a signal driving the transducer at a resonance frequency inducing a predetd. order of resonance on the partially treated microcantilever. Upon insertion into a monitored atm., mols. of the targeted chem. attach to the treated regions of the microcantilever resulting in a change in oscillating mass as well as a change in microcantilever spring const. thereby influencing the resonant frequency of the microcantilever oscillation. Also, the mol. attachment of the target chem. to the treated regions induce areas of mech. strain in the microcantilever consistent with the treated regions thereby influencing microcantilever bending. The rate at which the treated microcantilever

accumulates the target chem. is a function of the target chem. concn. Consequently, the extent of microcantilever oscillation frequency change and bending is related to the concn. of target chem. within the monitored atm.

L61 ANSWER 7 OF 22 CAPLUS COPYRIGHT 2002 ACS

ACCESSION NUMBER: 1997:168510 CAPLUS
DOCUMENT NUMBER: 126:192729
TITLE: Scanning probe microscope sensors
INVENTOR(S): Kanya, Nobutaka
PATENT ASSIGNEE(S): Olympus Optical Co, Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 7 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------------------------|------|----------|-----------------|--------------|
| JP 09015249 | A2 | 19970117 | JP 1995-183326 | 19950628 <-- |
| PRIORITY APPLN. INFO.: | | | JP 1995-183326 | 19950628 |

AB The sensors comprise: a Si₃N₄ 1st **cantilever** with a probe tip; and a 2nd **cantilever** contg. a p/n Si **photodiode** for detecting the probing light reflected by the tip.

L61 ANSWER 8 OF 22 CAPLUS COPYRIGHT 2002 ACS

ACCESSION NUMBER: 1997:9134 CAPLUS
DOCUMENT NUMBER: 126:69031
TITLE: Atomic force microscope **cantilevers** having a single crystal **silicon** pyramid probe
INVENTOR(S): Takayama, Michio
PATENT ASSIGNEE(S): Olympus Optical Co, Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 11 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------------------------|------|----------|-----------------|--------------|
| JP 08262040 | A2 | 19961011 | JP 1995-84478 | 19950317 <-- |
| PRIORITY APPLN. INFO.: | | | JP 1995-84478 | 19950317 |

AB The title **cantilevers** comprise a single-supported beam, a beam holder, and a pyramid probe needle attached on the free-end of the **cantilevers**. The probe needle is made of single crystal Si and prepd. by cutting out of a Si piece having a bottom-surface at a (100) phase and giving one of side-surface at a (111) phase. The **cantilevers** are attached by a semiconductor sensor such as a piezoelec. resistance displacement sensor or a **photodiode** sensor. The arrangement makes possible to control the aspect ratio of the probes.

L61 ANSWER 9 OF 22 CAPLUS COPYRIGHT 2002 ACS

ACCESSION NUMBER: 1996:759741 CAPLUS
DOCUMENT NUMBER: 126:82595
TITLE: Improvements to atomic force microscopy **cantilevers** for increased stability
AUTHOR(S): Wenzler, L. A.; Moyes, G. L.; Beebe, T. P., Jr.
CORPORATE SOURCE: Dep. Chem., Univ. Utah, Salt Lake City, UT, 84112, USA
SOURCE: Review of Scientific Instruments (1996), 67(12), 4191-4197
CODEN: RSINAK; ISSN: 0034-6748

PUBLISHER: American Institute of Physics
DOCUMENT TYPE: Journal
LANGUAGE: English

AB A modification of com. manufd. at. force microscopy **cantilevers** which reduces the bending of the V-shaped legs due to changes in temp. is described. Au-coated Si nitride **cantilevers** are a bimorph system in which the different thermal expansion coeffs. of the materials comprising the system can produce a temp.-dependent change in curvature. Other stress-related effects might also be responsible for the obsd. bending. By removing the Au film and redepositing Au only at the end of the V-shaped legs, a redn. in the bending of the **cantilever** is accomplished while the required optical reflectivity for the laser deflection system is retained. Imaging XPS, SEM, and changes in the detector **photodiode** signal related to bending of the **cantilever** are shown for modified and unmodified tips.

L61 ANSWER 10 OF 22 CAPLUS COPYRIGHT 2002 ACS

ACCESSION NUMBER: 1996:759610 CAPLUS
DOCUMENT NUMBER: 126:177189
TITLE: Interdigital **cantilevers** for atomic force microscopy
AUTHOR(S): Manalis, S. R.; Minne, S. C.; Atalar, A.; Quate, C. F.
CORPORATE SOURCE: E. L., Ginzton Lab., Stanford Univ., Stanford, CA, 94305-4085, USA
SOURCE: Applied Physics Letters (1996), 69(25), 3944-3946
CODEN: APPLAB; ISSN: 0003-6951
PUBLISHER: American Institute of Physics
DOCUMENT TYPE: Journal
LANGUAGE: English

AB The authors present a sensor for the AFM where a Si **cantilever** is micromachined into the shape of interdigitated fingers that form a diffraction grating. When detecting a force, alternating fingers are displaced while remaining fingers are held fixed. This creates a phase sensitive diffraction grating, allowing the **cantilever** displacement to be detd. by measuring the intensity of diffracted modes. This **cantilever** can be used with a std. AFM without modification while achieving the sensitivity of the interferometer and maintaining the simplicity of the optical lever. Since optical interference occurs between alternating fingers that are fabricated on the **cantilever**, laser intensity rather than position can be measured by crudely positioning a **photodiode**. The authors est. that the rms noise of this sensor in a 10 Hz-1 kHz bandwidth is .apprx. -0.02 .ANG. and present images of graphite with at. resolu.

L61 ANSWER 11 OF 22 CAPLUS COPYRIGHT 2002 ACS

ACCESSION NUMBER: 1996:322897 CAPLUS
DOCUMENT NUMBER: 125:44525
TITLE: Conversion of evanescent into propagating light in near-field scanning optical microscopy
AUTHOR(S): Fukuzawa, Kenji; Kuwano, Hiroki
CORPORATE SOURCE: NTT Interdisciplinary Res. Laboratories, Tokyo, 180, Japan
SOURCE: Journal of Applied Physics (1996), 79(11), 8174-8178
CODEN: JAPIAU; ISSN: 0021-8979
PUBLISHER: American Institute of Physics
DOCUMENT TYPE: Journal
LANGUAGE: English

AB Conversion of evanescent light into propagating light (as needed in near-field scanning optical microscopy) is analyzed by a photocantilever. The photocantilever is a Si **cantilever** with a pn junction **photodiode** on its tip. The photocantilever tip converts evanescent light from a sample into propagating light. Theor. values

given by scattering and transmission models are compared with the authors' exptl. values. The scattering model gives results that are closer to the exptl. values than does the transmission model. The non-propagating evanescent light is converted into scattered light at the photocantilever tip, and the scattered light is collected by the **photodiode**.

L61 ANSWER 12 OF 22 CAPLUS COPYRIGHT 2002 ACS

ACCESSION NUMBER: 1996:72814 CAPLUS

DOCUMENT NUMBER: 124:98309

TITLE: Scanning near-field optical microscope using an atomic force microscope **cantilever** with integrated **photodiode**

AUTHOR(S): Akamine, S.; Kuwano, H.; Yamada, H.

CORPORATE SOURCE: NTT Interdisciplinary Res. Lab., Musahino, 160, Japan

SOURCE: Applied Physics Letters (1996), 68(5), 579-81

CODEN: APPLAB; ISSN: 0003-6951

PUBLISHER: American Institute of Physics

DOCUMENT TYPE: Journal

LANGUAGE: English

AB A combined at. force and scanning near-field optical microscope is presented. The crit. component of the instrument is a single crystal **silicon**, microfabricated force-sensing **cantilever** with an integrated **photodiode**. Near-field optical images are obtained by monitoring variations in the optical power detected by the **photodiode** while the **cantilever** tip is scanned in an evanescent optical field created by illuminating the sample by total internal reflection. Near-field optical power was detected at tip-sample spacings of one-quarter wavelength. At. force and scanning near-field optical microscope images of the same samples show corresponding features as small as 25 nm.

L61 ANSWER 13 OF 22 CAPLUS COPYRIGHT 2002 ACS

ACCESSION NUMBER: 1995:1002530 CAPLUS

DOCUMENT NUMBER: 124:73230

TITLE: Imaging of optical and topographical distributions by simultaneous near field scanning optical/atomic force microscopy with a microfabricated photocantilever

AUTHOR(S): Fukuzawa, Kenji; Tanaka, Yuriko; Akamine, Shinya;

Kuwano, Hiroki; Yamada, Hirofumi

CORPORATE SOURCE: Interdisciplinary Res. Laboratories, Nippon Telegraph and Telephone Corporation, Tokyo, 180, Japan

SOURCE: Journal of Applied Physics (1995), 78(12), 7376-81

CODEN: JAPIAU; ISSN: 0021-8979

PUBLISHER: American Institute of Physics

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Simultaneous near field scanning optical and at. force microscopy with a microfabricated photocantilever reveal both optical and topog. distributions. The **cantilever** tip changes the evanescent field into scattering light, and this scattering light is detected with a **photodiode** fabricated in the tip of the **cantilever**. The **cantilever** deflection signal leads to at. force images. The resolu. for imaging the evanescent field variation was 20 nm ($\lambda/30$). The near field optical and at. force images indicate that the same point of the **cantilever** tip generates both optical and at. force signals. This method is a new approach to optical and topog. microscopy with nanometer resolu.

L61 ANSWER 14 OF 22 CAPLUS COPYRIGHT 2002 ACS

ACCESSION NUMBER: 1994:145104 CAPLUS

DOCUMENT NUMBER: 120:145104

TITLE: Development of an ultrahigh vacuum atomic force

microscope for investigations of semiconductor surfaces

AUTHOR(S): Kageshima, M.; Yamada, H.; Nakayama, K.; Sakama, H.; Kawazu, A.; Fujii, T.; Suzuki, M.

CORPORATE SOURCE: Natl. Res. Lab. Metrol., Tsukuba, 305, Japan

SOURCE: Journal of Vacuum Science & Technology, B: Microelectronics and Nanometer Structures (1993), 11(6), 1987-91

CODEN: JVTBD9; ISSN: 0734-211X

DOCUMENT TYPE: Journal

LANGUAGE: English

AB A new at. force microscope (AFM) adapted for ultrahigh vacuum operation is described. This AFM uses the optical beam deflection method to detect the **cantilever** displacement. Both the laser diode and the **photodiode** sensor are contained within the vacuum chamber. An inchworm motor mechanism is used for the tip-sample approach. Up to 8 **cantilevers** are stored in the chamber and can be used without breaking vacuum. The vacuum system is equipped with a sample heater, an evapn. cell, a gas inlet valve, and a LEED system, for observing semiconductor surfaces. Imaging of a graphite surface and a clean Si (111) surface with step structures were obtained.

L61 ANSWER 15 OF 22 CAPLUS COPYRIGHT 2002 ACS

ACCESSION NUMBER: 1992:224406 CAPLUS

DOCUMENT NUMBER: 116:224406

TITLE: Compound-semiconductor/**silicon** substrate **photodiode**

INVENTOR(S): Ohara, Tagahiko; Usui, Masaaki; Ogasawara, Nobuyoshi; Mitsui, Kotaro

PATENT ASSIGNEE(S): Mitsubishi Electric Corp., Japan; Nippon Telegraph and Telephone Corp.

SOURCE: Jpn. Kokai Tokkyo Koho, 11 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|-------------|------|----------|-----------------|--------------|
| JP 03283474 | A2 | 19911213 | JP 1990-86130 | 19900329 <-- |
| JP 2548820 | B2 | 19961030 | | |

PRIORITY APPLN. INFO.: JP 1990-86130 19900329

AB The **photodiode** typically comprises: (1) a Si substrate; (2) an n-GaAs; and (3) a p-GaAs; (4) a p-AlGaAs layer, wherein the n- and the p-electrode terminals are formed on the opposite ends of (1) and (4), resp., with a **cantilever** base-bar mounting for minimizing the interlayer strains due to a differential thermal expansion between (1) and the GaAs laminate. An array of the **photodiodes** forms a high-conversion solar battery.

L61 ANSWER 16 OF 22 COMPENDEX COPYRIGHT 2002 EEI

ACCESSION NUMBER: 2001(44):12279 COMPENDEX

TITLE: **Cantilever** probe integrated with light-emitting diode, waveguide, aperture, and **photodiode** for scanning near-field optical microscope.

AUTHOR: Sasaki, Minoru (Tohoku Univ, Sendai, Japan); Tanaka, Kotaro; Hane, Kazuhiro

SOURCE: Japanese Journal of Applied Physics, Part 1: Regular Papers & Short Notes & Review Papers v 39 n 12 2000

2000.p 7150-7153

CODEN: JAPNDE

PUBLICATION YEAR: 2000

DOCUMENT TYPE: Journal
TREATMENT CODE: Theoretical
LANGUAGE: English

AN 2001(44):12279 COMPENDEX

AB A microfabricated scanning near-field optical microscope (SNOM) probe integrated with a light-emitting diode, waveguide, aperture, and **photodiode** is described. This probe includes all optical elements necessary for SNOM on the Si **cantilever**. By using a-Si as the core layer and SiO₂ as the cladding layer, the process for fabricating the waveguide is compatible with that for fabricating the **photodiode**. The light is confirmed to transmit along the waveguide route with the large curvature. The obtained SNOM image shows a spatial resolution better than 200 nm. (Author abstract) 14 Refs.

L61 ANSWER 17 OF 22 COMPENDEX COPYRIGHT 2002 EEI

ACCESSION NUMBER: 2001(23):3106 COMPENDEX
TITLE: 23rd Edition of the International Semiconductor Conference (CAS 2000).

MEETING TITLE: 2000 International Semiconductor Conference.

MEETING LOCATION: Sinaia, Romania

SOURCE: Proceedings of the International Semiconductor Conference, CAS v 2 2000. 166p

PUBLICATION YEAR: 2000

MEETING NUMBER: 58083

DOCUMENT TYPE: Conference Proceedings

TREATMENT CODE: Theoretical

LANGUAGE: English

AN 2001(23):3106 COMPENDEX

AB The proceedings contain 38 papers from 2000 International Semiconductor Conference. Topic discussed include: chalcogenide semiconductor; multilayer grating; micro and nanotechnologies; sol-gels; novel design structures; opto-electrical properties; carbon based layers; and micro-particles. (Edited abstract)

L61 ANSWER 18 OF 22 COMPENDEX COPYRIGHT 2002 EEI

ACCESSION NUMBER: 1999(43):2272 COMPENDEX

TITLE: Micromachined photonic integrated circuits for sensor applications - experimental results.

AUTHOR: Cristea, Dana (Natl Inst for R&D in Microtechnologies, Bucharest, Rom); Muller, Raluca; Pavelescu, Ioan

MEETING TITLE: Proceedings of the 1999 Design, Test, and Microfabrication of MEMS and MOEMS.

MEETING ORGANIZER: SPIE; CNRS-INPG-UJF

MEETING LOCATION: Paris

MEETING DATE: 30 Mar 1999-01 Apr 1999

SOURCE: Proceedings of SPIE - The International Society for Optical Engineering v 3680 n. II 1999.p 1141-1150
CODEN: PSISDG ISSN: 0277-786X

PUBLICATION YEAR: 1999

MEETING NUMBER: 55516

DOCUMENT TYPE: Journal

TREATMENT CODE: Application; Experimental

LANGUAGE: English

AN 1999(43):2272 COMPENDEX

AB The paper presents the integration on the same chip of: Mach - Zehnder interferometers and Y junctions based on SiON waveguides, 3D movable micromechanical structures (diaphragms and **cantilevers**), optical couplers and photodetectors for optical read-out. The SiON low loss optical waveguides were fabricated by LPCVD processes, compatible with CMOS technology. The diaphragms, used for pressure sensing, obtained by p plus etch stop techniques, were placed under the sensing arm of the interferometer. The **cantilevers**, used in micromechanical resonators were manufactured by front side micromachining. The optical waveguides were coupled with different types of photodetectors, for

optical read-out. Also experiments for hybrid integration of an emitting device have been performed. We used an AlGaAs emitting diode ($\lambda = 628$ nm), with high edge emission, mounted in a **silicon** groove, on the same water with the sensor. The lateral emitted light is coupled in the waveguide. One of the main problems that had to be solved will be the matching of all the involved technologies. The result of our research is the demonstration of the compatibility between the technological processes involved and the possibility of integration on the same **silicon** substrate of different components: waveguides, **photodiodes**, emitting devices, 3D movable microstructures in order to realize intelligent microsensors. (Author abstract) 36 Refs.

L61 ANSWER 19 OF 22 COMPENDEX COPYRIGHT 2002 EEI

ACCESSION NUMBER: 1999(3):7522 COMPENDEX
TITLE: 3D microstructures integrated with optical waveguides and **photodiodes** on **silicon**.
AUTHOR: Muller, Raluca (Natl Inst for Research and Development in Microtechnologies, Bucharest, Rom); Pavelescu, Ioan; Manea, Elena
MEETING TITLE: Proceedings of the 1998 9th Mediterranean Electrotechnical Conference, MELECON. Part 1 (of 2).
MEETING ORGANIZER: IEEE
MEETING LOCATION: Tel-Aviv, Israel
MEETING DATE: 18 May 1998-20 May 1998
SOURCE: Proceedings of the Mediterranean Electrotechnical Conference - MELECON v 1 1998. IEEE, Piscataway, NJ, USA, 98CH36056.p 392-395
CODEN: PMECFA
PUBLICATION YEAR: 1998
MEETING NUMBER: 49235
DOCUMENT TYPE: Conference Article
TREATMENT CODE: Experimental
LANGUAGE: English

AN 1999(3):7522 COMPENDEX

AB This paper reports experimental realization of 3D microstructures (**cantilevers**) integrated with optical waveguides and **photodiodes** on **silicon**, in order to obtain opto-electro-mechanical microsystems. The freestanding structures were released by anisotropic front side etching in KOH solutions and consist in a SiO₂/SiON/SiO₂ sandwich, with excellent mechanical properties. The fabrication of micromechanical and microoptical elements is compatible with the materials and processes used in conventional IC technology. (Author abstract) 7 Refs.

L61 ANSWER 20 OF 22 COMPENDEX COPYRIGHT 2002 EEI

ACCESSION NUMBER: 1996(23):125 COMPENDEX
TITLE: Atomic force microscope measurements of the hardness and elasticity of peritubular and intertubular human dentin.
AUTHOR: Kinney, J.H. (Univ of California, Livermore, CA, USA); Balooch, M.; Marshall, S.J.; Marshall, G.W.Jr.; Weihs, T.P.
SOURCE: Journal of Biomechanical Engineering, Transactions of the ASME v 118 n 1 Feb 1996.p 133-135
CODEN: JBENDY ISSN: 0148-0731
PUBLICATION YEAR: 1996
DOCUMENT TYPE: Journal
TREATMENT CODE: Experimental
LANGUAGE: English

AN 1996(23):125 COMPENDEX

AB An atomic force microscope was used to measure the hardness and elasticity of fully-hydrated peritubular and intertubular human dentin. The standard **silicon** nitride AFM tip and **silicon cantilever** assembly were replaced with a diamond tip and stainless steel

cantilever having significantly higher stiffness. Hardness was measured as the ratio of the applied force to the projected indentation area for indentations with depths from 10-20 nm. The sample stiffness was measured by imaging specimens in a force-modulated mode. Hardness values of 2.3 plus or minus 0.3 GPa and 0.5 plus or minus 0.1 GPa were measured for the peritubular and intertubular dentin, respectively. Stiffness imaging revealed that the elastic modulus of the peritubular dentin was spatially homogeneous; whereas, there was considerable spatial variation in the elasticity of the intertubular dentin. The atomic force microscope can be used to measure the mechanical properties of fully hydrated calcified tissues at the submicron level of spatial resolution, thus augmenting more traditional depth sensing probes. (Author abstract) 11 Refs.

L61 ANSWER 21 OF 22 COMPENDEX COPYRIGHT 2002 EEI

ACCESSION NUMBER: 1995(9):353 COMPENDEX
TITLE: New, optical-lever based atomic force microscope.
AUTHOR: Hansma, P.K. (Univ of California, Santa Barbara, CA, USA); Drake, B.; Grigg, D.; Prater, C.B.; Yashar, F.; Gurley, G.; Elings, V.; Feinstein, S.; Lal, R.
SOURCE: Journal of Applied Physics v 76 n 2 July 15 1994.p 796-799
CODEN: JAPIAU ISSN: 0021-8979
PUBLICATION YEAR: 1994
DOCUMENT TYPE: Journal
TREATMENT CODE: Application; Experimental
LANGUAGE: English
AN 1995(9):353 COMPENDEX

AB The novel Atomic Force Microscope (AFM) is presented in this paper. It has the capability to image large samples such as live cells in Petri dishes or intact **silicon** wafers. It can also operate at nanoNewton forces over scan areas of order 100 μ m because the **cantilever** is tracked with a scanning focused spot. It possesses an open arrangement that enables it to be integrated with other instruments such as optical microscope with high numerical aperture as utilized for the cell images presented in this study. An AFM is under development to be combined with a scanning electron microscope for in-situ, electron-beam-deposited tip fabrication.18 Refs.

L61 ANSWER 22 OF 22 COMPENDEX COPYRIGHT 2002 EEI

ACCESSION NUMBER: 1984(12):210355 COMPENDEX
DOCUMENT NUMBER: 8412137618
; *84115123
TITLE: SENSORS IN **SILICON**.
AUTHOR: Allan, Roger (Electronic Design, Rochelle Park, NJ, USA)
SOURCE: High Technol (Boston) v 4 n 9 Sep 1984 p 43-50
CODEN: HTECD3
PUBLICATION YEAR: 1984
LANGUAGE: English
AN 1984(12):210355 COMPENDEX DN 8412137618; *84115123
AB Electronic control systems are considered that use sensors to measure such physical parameters as pressure, temperature, fluid flow or light intensity. As most of the major elements of these systems are available in monolithic form on **silicon** chips, an effort is considered to have also the sensors put onto the same microchip with the circuitry. This integrating of sensing elements is described. A typical control system configuration is given and examples of integrated **silicon** membrane pressure sensors, **silicon** diaphragm fluid sensor, **silicon cantilever** beam force sensor, and zinc-oxide acoustic sensor are presented. **Photodiode** arrays as image sensors and coated **silicon** surfaces used for gas detection are also considered.